

**FUTURE FISHERIES IMPROVEMENT PROGRAM
GRANT APPLICATION**

(Please fill in the highlighted areas)

all sections (IA, IB, IC, etc.) must be addressed or the application will be considered invalid

I. APPLICANT INFORMATION

- A. Applicant Name: Carol Endicott
- B. Mailing Address: 1354 Highway 10 West
- C. City: Livingston State: MT Zip: 59047
- Telephone: 406 222-3710 E-mail: cendicott@mt.gov
- D. Contact Person: _____
- Address if different from Applicant: _____
- City: _____ State: _____ Zip: _____
- Telephone: _____ E-mail: _____
- E. Landowner and/or Lessee Name (if other than Applicant): Melvin Goffena
- Mailing Address: 290 Horse Creek Road
- City: Wilsall State: MT Zip: 59806
- Telephone: 578-2054 E-mail: dirtandchaff@gmail.com

II. PROJECT INFORMATION*

- A. Project Name: Horse Creek Grazing Management and Stream Restoration
- River, stream, or lake: Horse Creek
- Location: Township: 3N Range: 9E Section: 24
- Latitude: 45.9945 Longitude: -110.5491 *within project (decimal degrees)*
- County: Park
- B. Purpose of Project:
- The purpose of the project is to restore habitat and decrease sediment loading in a section of Horse Creek, a stream that supports nonhybridized Yellowstone cutthroat trout.
- C. Brief Project Description: _____

Horse Creek is a tributary of the Shields River that supports nonhybridized Yellowstone cutthroat trout. Population estimates in reaches with high quality habitat indicate a dense population, with cutthroat trout of considerable size for a small stream. Within the project area, livestock grazing practices have been incompatible with stream health. Many banks are eroding, hoof shear is common, and riparian shrubs are not recruiting. In addition, the stream abuts terraces topped with smooth brome in several locations, and these banks are sloughing tremendous quantities of fine sediment into the stream. A thick layer of silt covers the streambed throughout the reach. The project entails managing livestock's access to the stream through riparian fencing. Off-stream watering devices will provide stock water. Although most eroding banks will recovery naturally with rest from grazing, the eroding terraces will require mechanical restoration. Floodplain benches will be constructed adjacent to the eroding terraces using wetland sod harvested from the site. Mature willows will be planted on the constructed floodplains. Willow recovery will be expedited with willow sprigs. The pastures will be rested for 5 years, and then flash grazed in the fall afterwards.

D. Length of stream or size of lake that will be treated: 3,160 feet

E. Project Budget:

Grant Request (Dollars): \$ \$26,228

Contribution by Applicant (Dollars): \$ In-kind \$
(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): \$ 44,870 In-kind \$ 3,444
(attach verification - See page 2 budget template)

Total Project Cost: \$ 74,542

F. Attach itemized (line item) budget – see template

G. Attach specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support and fish biologist support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete supplemental questionnaire (fwp.mt.gov/habitat/futurefisheries/supplement2.doc).

H. Attach land management and maintenance plans that will ensure protection of the reclaimed area.

III. PROJECT BENEFITS*

A. What species of fish will benefit from this project?:

Yellowstone cutthroat trout are the most abundant fish in Horse Creek. Brook trout and brown trout have been captured on one sampling occasion. Other native species that will benefit include longnose dace, sculpin, and white sucker.

B. How will the project protect or enhance wild fish habitat?:

The combination of natural recovery with some mechanical restoration will restore the quality of the habitat in Horse Creek. Woody and herbaceous species will recolonize the stream corridor through natural recovery and plantings. Eroding banks will heal with recovery of riparian health and function. Construction of floodplain benches between the eroding terraces and the stream will restore habitat and tremendously reduce sediment loading. Water quality will be improved with a reduction of sediment loading and a narrower, deeper, shaded channel.

- C. Will the project improve fish populations and/or fishing? To what extent?:

The project will improve fish populations by increasing the quality of the habitat, and reducing sediment loading. Decreasing siltation will increase the forage base for fish, as aquatic invertebrates are an important component of fish diets. Similarly, invertebrates of terrestrial origin, which comprise a large portion of fish diets, will increase with recovery of the riparian corridor. The decreased siltation will improve quality of the substrate for spawning.

- D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

Horse Creek receives little fishing pressure. The stream ranking for angler days ranges from 190 to 338 for Region 3. Legal access is limited, as few public right of ways cross the stream. The landowner allows fishing.

- E. The project agreement includes a 20-year maintenance commitment. Please discuss your ability to meet this commitment.

The landowner was amused by the 20 year commitment, saying "do you know how old I'll be in 20 years?" Should the property change hands, or come under new management within the family, the current landowner will transfer the agreement to the new landowner/manager.

- F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

A combination of incompatible livestock grazing practices, and hayfields encroaching on the stream is the cause of habitat degradation. Resting the riparian area for 5 years will allow the banks to heal, and the riparian vegetation to recover its health and function. Afterwards, flash grazing would occur in the fall, when banks are hard, and vegetation is dormant. The eroding terraces will require mechanical restoration with construction of floodplain benches that will take the shear stress off the toes of the terraces, and allow the stream access to its floodplain.

- G. What public benefits will be realized from this project?:

The public will benefit from improved habitat for Yellowstone cutthroat trout, a species of concern, and the target of considerable conservation effort. As the Shields River is the northernmost part of the Yellowstone cutthroat trout's range, it has greater potential for resilience in the face of climate change. Securing high quality habitat for Yellowstone cutthroat trout will reduce justification for including the species for protection under the Endangered Species Act.

- H. Will the project interfere with water or property rights of adjacent landowners? (explain):

No

- I. Will the project result in the development of commercial recreational use on the site?: (explain):

No

J. Is this project associated with the reclamation of past mining activity?:


No

Each approved project sponsor must enter into a written agreement with the Department specifying terms and duration of the project.

IV. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature:



Date:

5/31/2017

Sponsor (if applicable):

***Highlighted boxes will automatically expand.**

**Mail To: Montana Fish, Wildlife & Parks
Habitat Protection Bureau
PO Box 200701
Helena, MT 59620-0701**

**E-mail To: Michelle McGree
mmcgree@mt.gov
(electronic submissions **MUST** be signed)**

**Incomplete or late applications will be rejected and returned to applicant.
Applications may be rejected if this form is modified.**

*****Applications may be submitted at anytime, but must be signed and received by the Future Fisheries Program Officer in Helena before December 1 and June 1 of each year to be considered for the subsequent funding period.*****

Budget

WORK ITEMS (ITEMIZE BY CATEGORY)	NUMBER OF UNITS	UNIT DESCRIPTION*	COST/UNIT	TOTAL COST	CONTRIBUTIONS			
					FUTURE FISHERIES REQUEST	IN-KIND SERVICES**	IN-KIND CASH	TOTAL
Personnel***								
Survey	1	lump sum	\$3,200.00	\$3,200.00			\$3,200.00	\$3,200.00
Design	1	lump sum	\$1,750.00	\$1,750.00			\$1,750.00	\$1,750.00
Oversight	1	lump sum	\$5,440.00	\$5,440.00			\$5,440.00	\$5,440.00
Permitting	1	lump sum	\$2,980.00	\$2,980.00			\$2,980.00	\$2,980.00
			Sub-Total	\$13,370.00	\$0.00	\$0.00	\$13,370.00	\$13,370.00
Construction Materials****								
Electric fence installed	2250	feet	\$1.60	\$3,600.00	\$1,800.00	\$1,800.00		\$3,600.00
Pipe line A & installation	100	feet	\$2.97	\$297.00	\$297.00			\$297.00
Pipe line B & installation	475	feet	\$2.97	\$1,410.75	\$1,410.75			\$1,410.75
Well	50	feet	\$176.00	\$8,800.00	\$8,800.00			\$8,800.00
Solar pump & installation	1	< 250 ft of total dynamic head	\$7,150.00	\$7,150.00	\$7,150.00			\$7,150.00
Stock tank (1100 gallon)	2	lump sum	\$2,662.00	\$5,324.00	\$5,324.00			\$5,324.00
Seed	2	10 pound bag	\$120.00	\$240.00	\$240.00			\$240.00
Wooden stakes	200	stakes	\$2.25	\$450.00	\$450.00			\$450.00
			Sub-Total	\$27,271.75	\$25,471.75	\$1,800.00	\$0.00	\$27,271.75
Equipment and Labor								
willow harvesters	80	hours	\$15.00	\$1,200.00		\$1,200.00		\$1,200.00
Willow planters	80	hours	\$15.00	\$1,200.00		\$1,200.00		\$1,200.00
Terrace construction	350	Feet	\$80.00	\$28,000.00			\$28,000.00	\$28,000.00
				\$0.00				\$0.00
				\$0.00				\$0.00
			Sub-Total	\$30,400.00	\$0.00	\$2,400.00	\$28,000.00	\$30,400.00
Mobilization								
Low boy	8	hours	\$150.00	\$1,200.00			\$1,200.00	\$1,200.00
			Sub-Total	\$1,200.00	\$0.00	\$0.00	\$1,200.00	\$1,200.00
			TOTALS	\$71,041.75	\$25,471.75	\$4,200.00	\$41,370.00	\$71,041.75

MATCHING CONTRIBUTIONS (do not include requested funds)				
CONTRIBUTOR	IN-KIND SERVICE	IN-KIND CASH	TOTAL	Secured? (Y/N)
Landowner	\$ 1,800.00	\$ -	\$ 1,800.00	Y
volunteers	\$ 2,400.00	\$ -	\$ 2,400.00	N
DEQ 319	\$ -	\$ 41,370.00	\$ 41,370.00	N
TOTALS	\$ 4,200.00	\$ 41,370.00	\$ 45,570.00	

Project Overview

Horse Creek is a major tributary to the Shields River (Figure 1), and Yellowstone cutthroat trout are the most abundant fish (Figure 2). With the exception of an F1 hybrid, all Yellowstone cutthroat trout have tested as nonhybridized in Horse Creek. Population estimates have varied over time; however, Horse Creek has high conservation value, as it supports high densities of nonhybridized Yellowstone cutthroat trout.

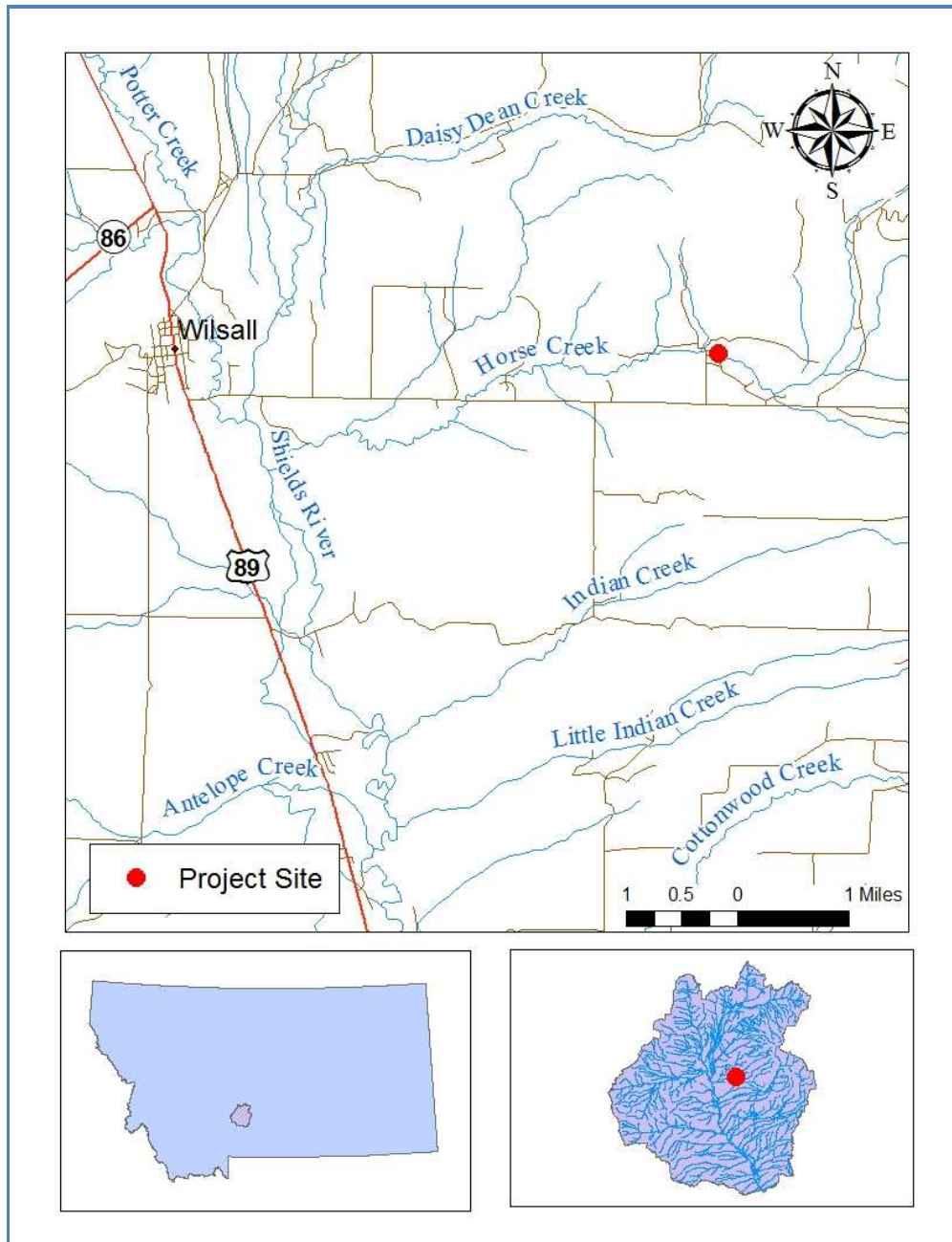


Figure 1. Overview map of Shields River watershed and project location



Figure 2. Mess o' Yellowstone cutthroat trout captured in Horse Creek downstream of the project area.

Stream and riparian habitat conditions are variable in the Horse Creek watershed, with high quality and impaired reaches being present. Implementation of restoration projects and grazing best management practices (BMPs) in tributaries to Horse Creek has been beneficial in restoring habitat quality and water quality. For example, reducing sediment inputs from eroding terraces, and controlling livestock near the stream has resulted in a striking reduction in siltation in South Fork Horse Creek (Figure 3). This project will build on other efforts to improve habitat and water quality within this important watershed.



Figure 3. Comparison of streambed siltation before restoration and 4 years after restoration on South Fork Horse Creek.

Riparian health and stream morphology differ between the upper and lower half of the project area (Figure 4). The upper half is a heavily grazed pasture, with marked degradation of riparian

health and function. Eroding banks are common, and the channel is overly wide and shallow adjacent to eroding banks (Figure 5). No shrub recruitment is apparent in this area, and the existing shrubs are isolated and decadent. Terrace erosion is considerable, with 350 ft of channel abutting vertical, fine-grained walls during high flows (Figure 6), and these terraces contribute considerable amounts of fine sediment into Horse Creek. Smooth brome occupies the tops of the eroding terraces, and their shallow, fine root systems provide no protection against erosion with shear stress at the toe of the bank. The large volume of sediment contributed from erosion results in extreme sedimentation of the streambed (Figure 7). In contrast, the downstream half of the pasture receives little grazing pressure, and riparian health and function and stream morphology are in excellent condition (Figure 8). This area will serve as a source of wetland sod and mature willows for terrace restoration.

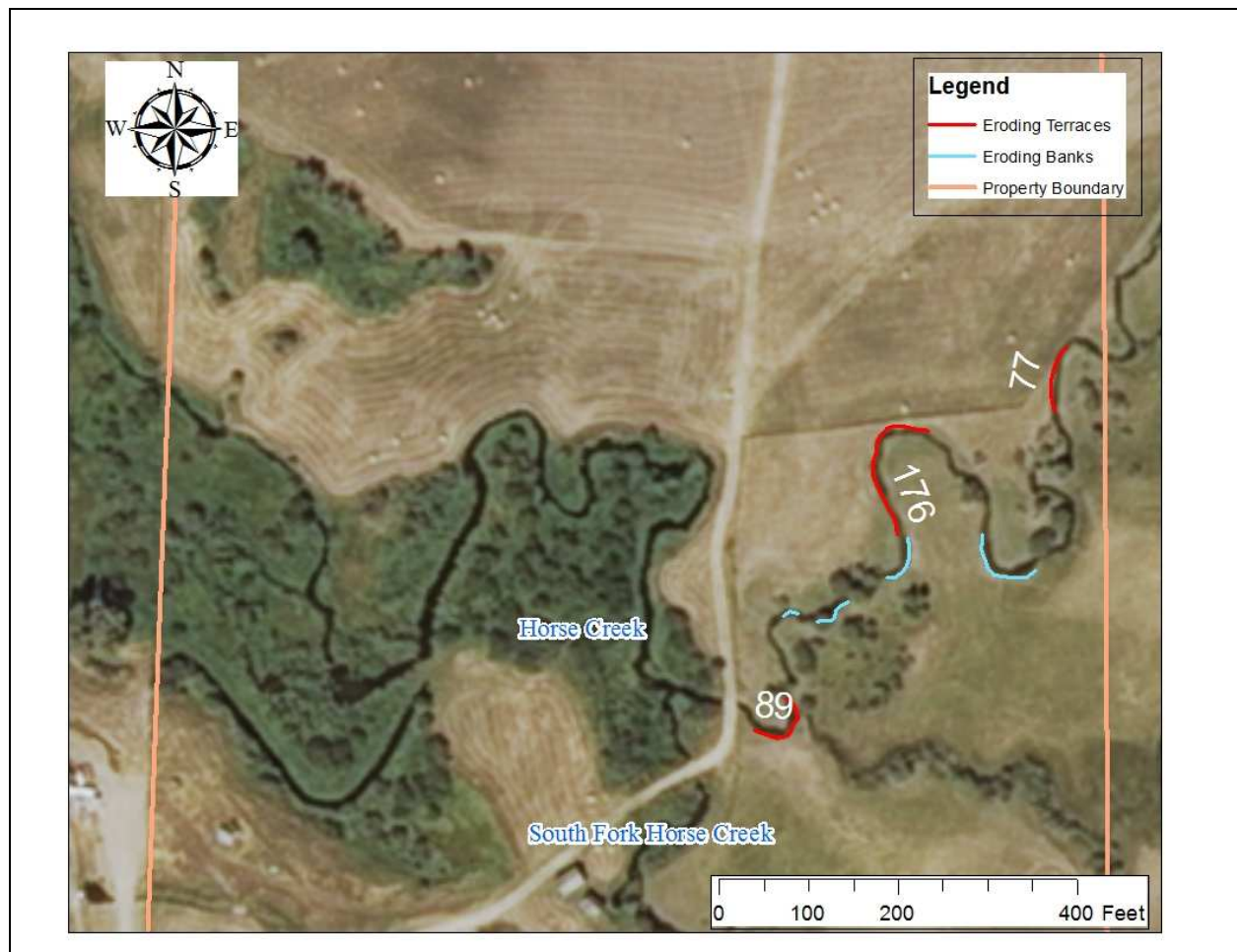


Figure 4. Aerial view of project area showing eroding banks and eroding terraces. The numbers are the number of feet where Horse Creek is eroding into a terrace.



Figure 5. Examples of bank erosion in Horse Creek.



Figure 6. Example of an eroding terrace on Horse Creek.



Figure 7. Siltation of the streambed.



Figure 8. Unimpaired portion of Horse Creek within the project area, and source of shrubs and wetland sod.

The restoration approach emphasizes natural recovery, with mechanical restoration occurring along terraces that will not heal without intervention. Installation of riparian fencing will allow control of cattle adjacent to the stream (Figure 9). The riparian pasture will be rested for 5 years, after which flash grazing will occur in the fall when the ground is hard, and banks are less susceptible to hoof shear. The fence will be a solar-powered electric fence with 1 hot wire and 1

ground wire. Stock water will be provided with 2 groundwater fed 1,100 gallon stock tanks. The landowner will install fencing. FFIP funds are being sought for fencing and stock water components of the project.

This project was submitted last funding cycle; however, it was tabled with the stock water plan being questioned. The NRCS's district conservationist spoke with Alan Johnstone regarding the rationale for the design, which considered the ease of operation for the landowner, who manages the ranch by himself, the reliability of obtaining water, and the effect of the fishery. The rationale for the proposed approach is described in Ted Nelson's letter of support at the end of this document.

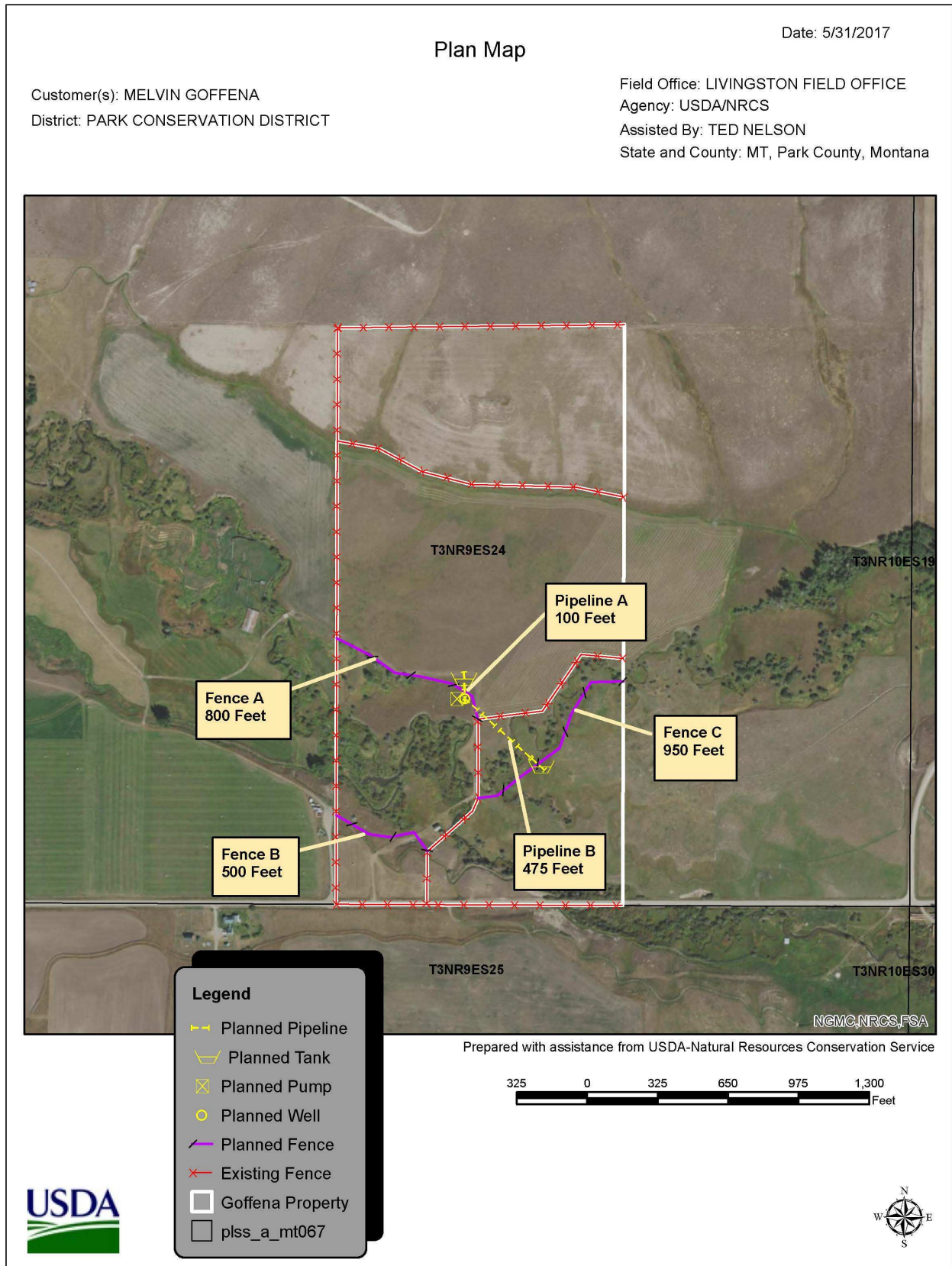


Figure 9. Plan view of fencing and off-channel water for Horse Creek.

Revised July 5, 2016

The terraces will not heal without intervention. High flows will continue to exert pressure on these banks, and they will continue to retreat. Construction of floodplain benches adjacent to the terraces will take the erosive force off the banks, and allow the stream better access to its floodplain (Figure 10). The banks will be constructed with stacked mats of wetland sod. Coir fabric will be used if hydraulic modeling conducted during design indicates sufficient shear stress on banks to warrant its inclusion. Spoils from excavation of a new, narrower and deeper channel will be used to back fill the floodplain bench behind the sod mats. Mature willows will be harvested from an unimpaired reach on the property, and transplanted in the floodplain bench.

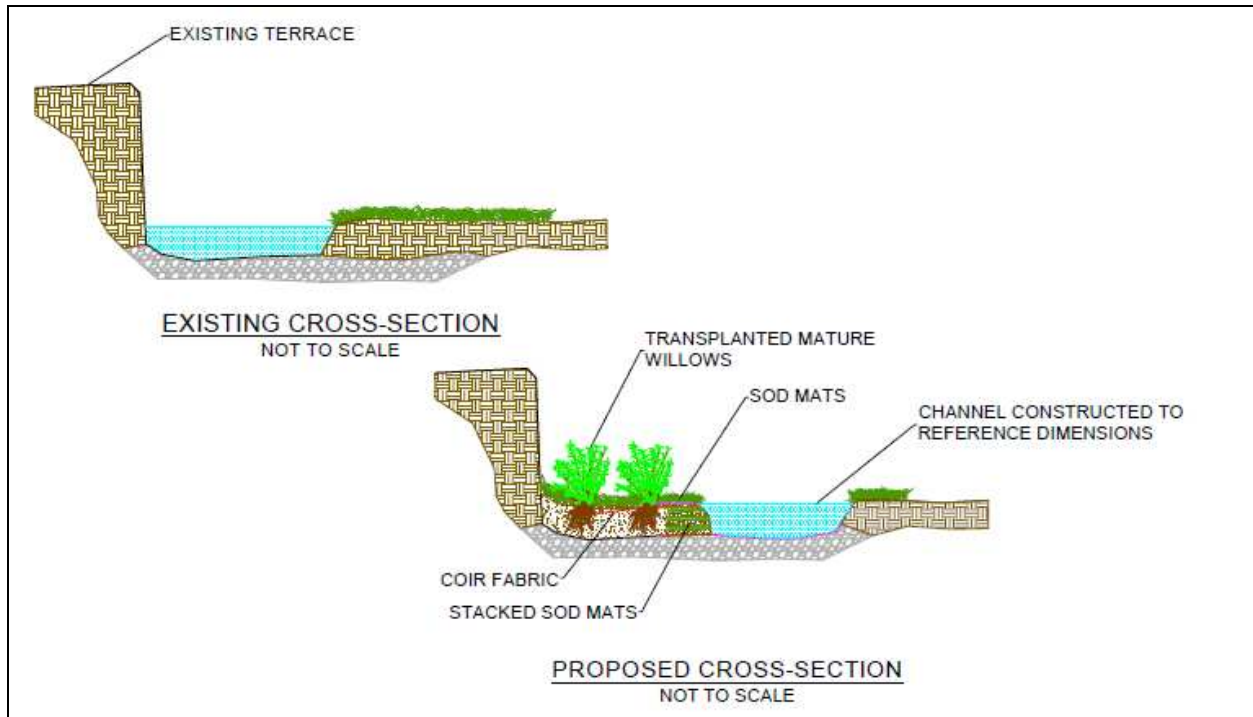


Figure 10. Conceptual approach to restoring reaches of Horse Creek adjacent to terraces.

The infestation of reed canary grass in neighboring reaches brings concerns regarding the potential for this invasive species to become established within the project area during the 5 years of rest. Reed canary grass holds banks together; however, it does not perform the same ecosystem functions as the native communities of graminoids, forbs, and shrubs. With the help of volunteers, planting of willow sprigs will jumpstart recovery of the shrub communities. Willows will be collected while dormant, soaked for at least 2 weeks, then planted along the bank full margin in the project area. In addition, a native seed mix will be sown along the banks to promote establishment of a native plant community before reed canary grass can invade the area, and form a monoculture. Volunteers will assist with harvest and planting of willow sprigs. Their rate follows recommendations from DEQ used on projects receiving 319 funding.



Natural Resources
Conservation Service

Livingston Field Office

5242 US Hwy 89 S
Livingston
Montana, 59047
Voice 406.946.3006
Fax 855.510.7025

May 31, 2017

Melvin Goffena / Horse Creek Grazing Management and Stream Restoration

Future Fisheries Improvement Program,

This letter is written to explain the reasoning behind the proposed stock water system consisting of an off-stream well, solar pump, pipelines, and stock tanks.

My intent was to design a system that, once installed, would have the least possible impact on Horse Creek and the fishery. In-stream structures could be employed to pipe water to stock tanks downstream but these often require periodic maintenance within the stream to provide continuous flow. A tank that captures ground water would likely work south of Horse Creek but the northern tank is planned on soil (Cabba-Bacbuster-Doney Complex) that has paralithic bedrock within 40 inches that would prevent easy access to groundwater. A well would likely be fairly shallow and provide consistent water with little maintenance. I suggested solar power since it would not be an ongoing cost to the producer and would not rely on fossil fuels. Piping the water across the creek would involve a brief disturbance that would heal quickly. Installing 1100 gallon stocktanks provides storage for the cattle if any repair work needs to be done.

I hope that this offers clarification for the grant review board. Thank you and please contact me with any questions you may have.

Yours truly,

Ted Nelson

Ted Nelson
District Conservationist
Livingston Field Office
Natural Resources Conservation Service
406-946-3006
theodore.nelson@mt.usda.gov

"Local Common Sense Conservation"

5242 Highway 89 South
Livingston, MT 59047

Telephone 406-222-2899x111
Fax 406-222-8538

November 17, 2016

Montana Fish, Wildlife & Parks
Habitat Protection Bureau
Future Fisheries Improvement Program
P.O. Box 200701
Helena, Montana 59620-0701

Re: Horse Creek Grazing Management & Stream Restoration Project Support

To whom it may concern,

On behalf of the Park Conservation District (here after known as the Park CD), I am pleased to present this letter of support for the Future Fisheries Improvement Program grant application submitted by Montana Fish, Wildlife & Parks. The Park CD is aware that FWP is requesting funding to restore habitat and decrease sediment loading in Horse Creek, which sustains nonhybridized Yellowstone cutthroat trout.

Given the scarcity of basin-level citadels remaining for Yellowstone cutthroat trout, the promotion of efforts toward streambank and terrace restoration, floodplain construction, grazing management, managing livestock's stream access, and establishing riparian vegetation is essential. The Shields River watershed is a model example, containing predominantly nonhybridized Yellowstone cutthroat trout distributed throughout the watershed. The habitat-quality enhancement and significant sediment-loading reduction outlined in the referenced proposal will undoubtedly serve to enhance the distribution and abundance of the native Yellowstone cutthroat trout.

Due to the fact that the Yellowstone cutthroat trout are a species of special concern, the Park CD finds it imperative to help secure, protect and restore the fish within its historic range. The proposed Horse Creek Grazing Management and Stream Restoration project will aid in the maintenance of a viable population of Yellowstone cutthroat trout while also significantly benefiting the water users and agriculture industry.

The Park CD has encouraged and supported the formation of watershed groups within Park County where previously there were no other functioning stakeholder groups, one of which being the Shield Valley Watershed Group (SVWG). The SVWG is a collection of ranchers, landowners and citizens of the community with a common goal of protecting

and improving the land, water and resources of the watershed. This collaboration extends beyond local landowners to include important federal, state and private partners such as Natural Resource Conservation Services (NRCS), Department of Natural Resources and Conservation (DNRC), Fish Wildlife and Parks, Montana TU and many others. The relationship between the Park Conservation District, the watershed group, and their partners provides an essential link to the community and continuation of successful conservation practices within Park County.

Conserving Yellowstone cutthroat trout in the Shields River watershed is also consistent with the mission of the SVWG. This group, originally formed in 1997 to promote conservation of Yellowstone cutthroat trout, has a track record of best management practices (BMPs) which benefit the fish population. The SVWG seeks to preserve and enhance Yellowstone cutthroat trout throughout the watershed, while maintaining flexibility in their ranching operations. This group has an impressive record of conservation projects aimed at conserving Yellowstone cutthroat trout and restoring water quality in the basin's streams, and this project will protect these investments in conservation.

Due to the notable benefits relating to conservation, management, and preservation of natural resources, the Park CD strongly endorses these efforts of Montana Fish, Wildlife & Parks. We believe the funds requested in the proposal will be extremely beneficial and instrumental to the augmentation of the Yellowstone cutthroat trout population. Please feel free to contact me at (406) 222-2899 ext. 111 with any questions regarding our support of this project.

Sincerely,



Jessica Mayo
Park Conservation District Administrator
jessica.anderson@mt.nacdnet.net